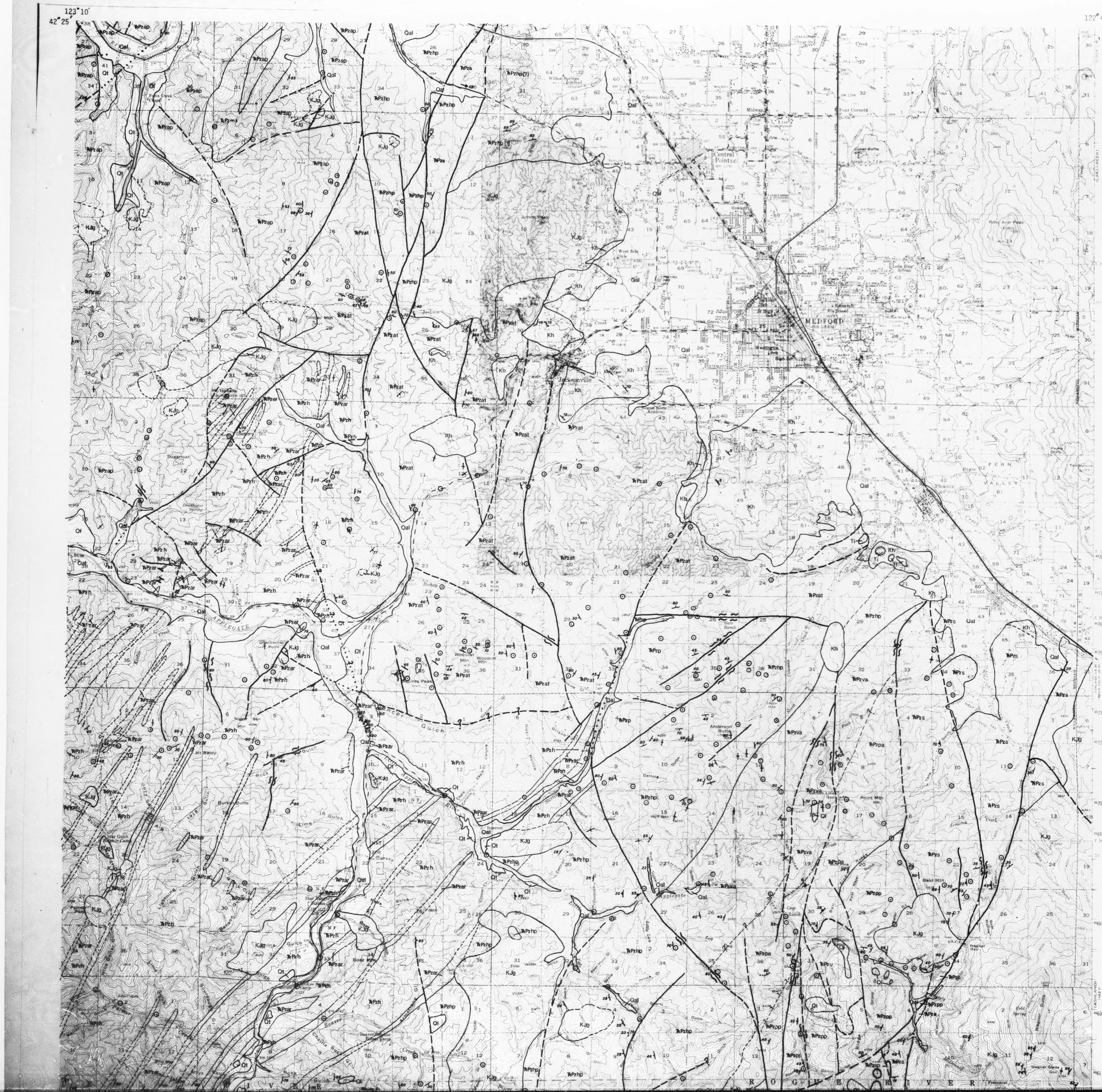
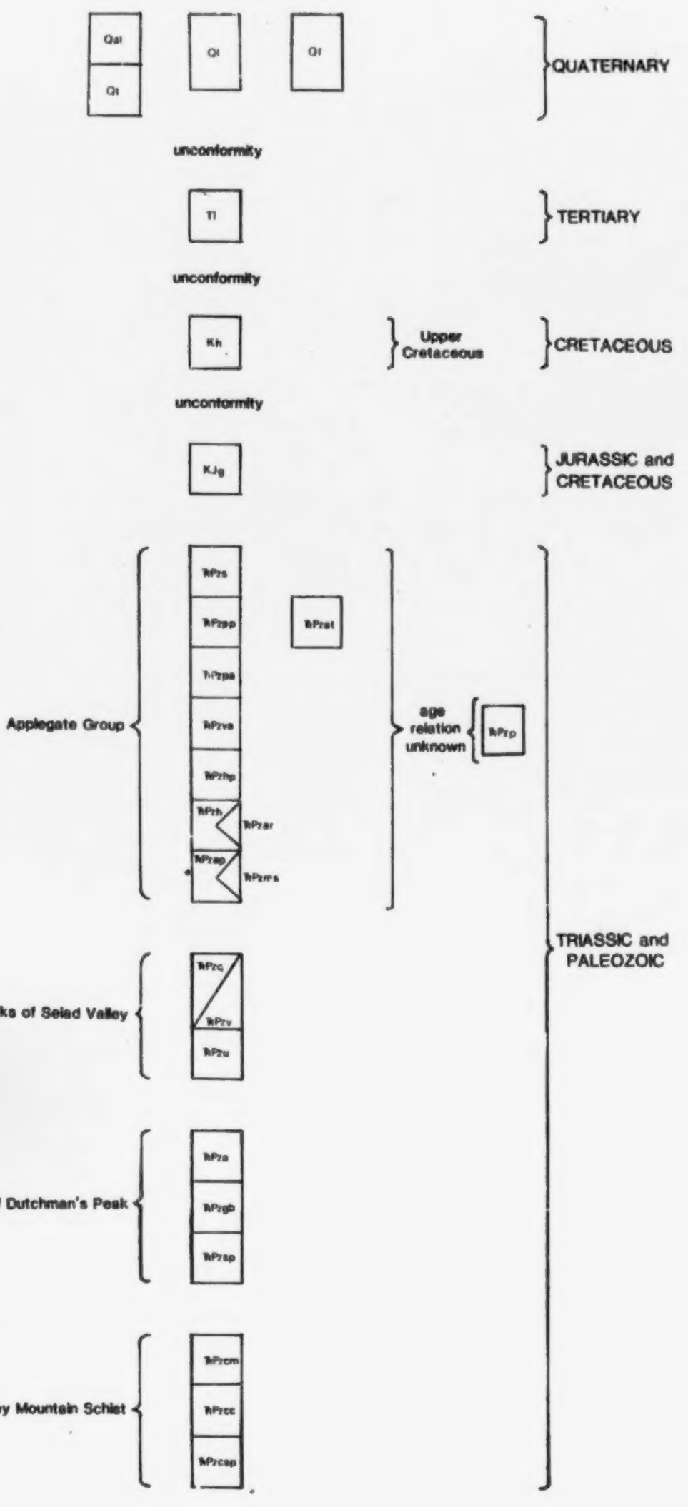
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

OPEN-FILE REPORT 81-1



Correlation of Map Units



DESCRIPTION OF MAP UNITS

Qal ALLUVIAL DEPOSITS--Unconsolidated sand, silt, and gravel that form modern flood plains, channel deposits, and low-lying terraces; channel deposits are found in or adjacent to modern streams, and are primarily composed of gravel and sand. The flood plains are generally flat to gently undulating surfaces, primarily composed of overbank silt and sand overlying channel gravels. Modern flood plain surfaces are characterized by little or no soil development

Ql LANDSLIDE DEPOSITS--Debris from various mass wasting processes including slumps, earth flows, and debris flows

Qt TERRACE DEPOSITS--Alluvial deposits of unconsolidated silt, sand, and gravel; forms terraces 6 to 18 m above present stream grade and deposits are up to about 5 m thick; characterized by moderate to well-developed soils

Qf ALLUVIAL FAN DEPOSITS--Consist of unconsolidated poorly sorted crudely bedded sand, gravel, and silt that range from late Pleistocene through Holocene age. They form fan or conic shaped surfaces at the mouths of creeks where deposition results from decreased stream capacity due to decreased stream gradients. Crude lensoidal bedding indicates rapidly changing sedimentary conditions

Ti INTERMEDIATE COMPOSITION INTRUSIVE ROCKS--Small plugs and dikes in the Hornbrook Formation south of Phoenix

Kh HORNBROOK FORMATION (LATE CRETACEOUS)--Thin to thick well-bedded fine-grained arkosic and lithic sandstones interbedded with pebbly sandstones and conglomerate in the lower part and faintly laminated, to thin-bedded siltstones and mudstones in the upper part. Conglomerate includes pebbles of quartz, diorite, gneiss, and metavolcanic rocks and sandstone locally cemented by calcite. The Hornbrook Formation is Late Cretaceous (Cenomanian to Turonian) age (Peck and others, 1956); some of the fossils present include the ammonites Mantelliceras, Collignoniceras bakeri (Anderson), Prionocyclus cvenulata (Anderson), and mollusks of the Glycymeris pacificus fauna

KJg GRANITIC PLUTONIC ROCKS--Range widely in modal compositions from diorite to granite with tonalite the dominant rock type; generally gray to light-gray medium- to coarse-grained hypidiomorphic, inequigranular to equigranular, and locally porhyritic textures; consists of zoned, tabular to elongate plagioclase, potassium feldspar as phenocrysts but more commonly as groundmass and myrmeketic material, anhedral quartz, hornblende (commonly elongate), biotite, local muscovite, sphene, apatite, zircon, allanite, oxide and sulfide minerals, chlorite, and epidote-group minerals; Jacksonville pluton has a discordant K-Ar age of 134 m.y. on hornblende and 138 m.y. on biotite (Hotz, 1971); the Squaw Peaks pluton is characterized by numerous mafic xenoliths ranging in size from a few centimeters to thousands of millimeters in diameter composed of amphibolite, pyroxenite, peridotite, dunite, and gabbro; the Ashland pluton is composed of two intrusive phases (Donato, 1975 ; the initial phase being diked by the second phase; the initial phase consists of textural and compositional gradations of diorite, quartz diorite, tonalite, monzodiorite, quartz monzodiorite, granodiorite, quartz monzonite, and granite in which predominant mafic phase is hornblende; second phase is characterized by linear swarms of biotite-rich xenoliths and schlieren in quartz monzonite, granodiorite, and granite. Biotite is the dominant mafic mineral K-Ar ages on initial phase include a discordant 144-m.y. biotite and 160- and 166-m.y. hornblende; 146- to 147-m.y. hornblende-biotite age, and 133-m.y. biotite age (Hotz, 1971)

APPLEGATE GROUP

TrPz s SHALE--Mainly shales; includes minor sandstone, layered tuffs, and finely laminated chert; shales consist of microcrystalline micaceous clay, minor quartz; shales may be gradational with more clastic rocks composed of clasts of clinopyroxene (most abundant), and plagioclase in a micaceous laminated matrix; sandstones are predominantly arkosic and composed of feldspar, quartz, hornblende, and biotite. The unit is best exposed along Wagner Creek south of Arrastra Creek in the eastern corner of the Talent quadrangle due south of the town of Talent. Locally, near the Ashland pluton, shales are intruded and contact metamorphosed by granitic rocks

TrPz pp PORPHYRITIC PYROXENE-PLAGIOCLASE ANDESITE--Characterized by augite and plagioclase phenocrysts in a relict pilotaxitic groundmass, locally vesicular; contains agglomerate with aphanitic black clasts in highly sheared matrix; metamorphosed to assemblages of actinolite, epidote, chlorite, albite, and quartz; base not exposed

TrPz pa PORPHYRITIC PLAGIOCLASE ANDESITE--Characterized by plagioclase phenocryst-rich andesitic flows with relict piliotaxitic groundmass textures; upper part contains 100 to 300 m thick agglomerate showing clasts of augite-plagioclase porphyritic andesite with relict piliotaxitic groundmass textures; locally contains interbedded plagioclase crystal-rich tuffs; metamorphosed to assemblages of olive-green hornblende, actinolite, epidote, and chlorite; near granitic plutons developes hornfelsic and granofelsic textures with albite, quartz, biotite, and locally garnet, or into layered and locally lineated amphibolite; underlies pyroxene-plagioclase porphyritic andesite (TrPz pp).

TrPz va VESICULAR ANDESITIC TO BASALTIC FLOWS--Characterized by calcite filled amygdules in augite-plagioclase porphyritic andesitic to basaltic flows with relict piliotaxitic to hyalopilitic groundmasses interbedded with rare marble lenses and intermediate to mafic tuffs; locally, relict ophitic and intersertal groundmass textures occur; pillow breccias and pillow basalts occur locally near the top of the unit; marbles, generally impure, containing waterworked volcaniclastic debris; volcanic rocks metamorphosed to assemblages of green hornblende, actinolite, epidote, quartz, and chlorite although original mineralogy locally preserved; conformably overlies hornblende-plagioclase porphyritic andesite (TrPz hp)

TrPz hp PORPHYRITIC HORNBLENDE-PLAGIOCLASE ANDESITE--Characterized by near equal amounts of hornblende and plagioclase phenocrysts in relict hyalopilitic to intersertal, locally pilotaxitic groundmass textures in flows of andesitic composition; unit includes minor amounts of pyroclastic rocks, local amygdaloidal flows, and quartz-plagioclase porphyritic dacites; metamorphosed to assemblages of olive-green hornblende, blue-green hornblende, actinolite, epidote, quartz, chlorite, and carbonate minerals; conformably underlies vesicular andesite (TrPz va)

TrPz h PORPHYRITIC HORNBLENDE ANDESITE--Characterized by brown or olive-brown hornblende phenocrysts up to 1 cm in diameter in porphyritic hornblende and plagioclase andesitic flow rocks; interbedded with fine-grained to aphanitic argillites (TrPz ar); lower contact chosen to coincide with lowermost argillite; includes in upper part an apparent thickness of 3,000 to 5,000 m of andesitic pyroclastic volcanic rocks interbedded with minor amounts of porphyritic hornblende-plagioclase andesite and dacite to rhyodacite flows (best expresd near Tallowbox Mountain, Ruch quadrangle); in middle part contains minor amounts of porphyritic quartz-plagioclase dacite flows, dacitic to rhyodacitic agglomerates, and porphyritic augite andesite flows; lower part contains interbedded amygdaloidal porphyritic plagioclase andesite (apparent thickness 300-500 m) and minor porphyritic quartz-plagioclase dacite flows; relict groundmass textures predominantly hyalopilitic to piliotaxitic in flow rocks; andesitic pyroclastic rocks consist of breccias, thinly to moderately bedded waterworked tuffs, hornblende-plagioclase crystal-rich pyroclastic rocks, black aphanitic argillites, and minor agglomerate; whole unit contains interbedded argillites, which were mapped where scale permitted; rocks metamorphosed to assemblages of blue-green hornblende, actinolite-tremolite, epidote, albite, biotite, chlorite, quartz, and carbonate minerals; locally, original phenocrysts and groundmass textures were preserved; where sheared, rocks best classified as greenstone; conformably underlies porphyritic hornblende-plagioclase andesite unit (TrPz hp)

TrPz ar ARGILLITE--Black, gray, or red fine- and medium-grained locally aphanitic bedded tuff, volcaniclastic mudstones, and sandstones;

ROCKS OF SEIAD VALLEY

TrPz q QUARTZITE, METASEDIMENTARY ROCKS, MARBLES, AND INTERMEDIA SILICEOUS METAVOLCANIC ROCKS--Rocks regionally metamorpho greenschist facies and locally up to pyroxene-hornfels fac contact metamorphism forming impure quartzites, marbles, silicate rocks, hornfels, granofels, schists, gneisses amphibolites. Protoliths include impure quartz sand quartz-rich arkoses, limestones, graphitic shales, mud graywackes, volcaniclastic sandstones, thinly inter graphitic shales and quartz sandstones, thinly inter orthoquartzite and limestone; andesitic, dacitic, and si porphyritic and nonporphyritic flows, dikes, and sill pyroclastic rocks and tuffs; unit characterized by quartzites, quartz-biotite, and quartz-amphibole sc metamorphic mineralogy described by Godchaux (1969) i quartz, plagioclase (albite-oligoclase), orthoclase, ch biotite, muscovite, amphiboles, ortho- and clinopy clinozoisite, epidote, calcite, dolomite, cordierite, id diopside, tourmaline, andalusite, garnet, graphite, zircon, apatite, and oxide and sulfide minerals. lithologies suggestive of shallow marine fluctuating estuarine environment

TrPz v DACITIC TO ANDESITIC METAVOLCANIC ROCKS--Fine-grained, green, and black, massive to foliated regionally metamorphosed to andesitic flows, flow breccias, agglomerate, tuff a breccia interlayered with metasedimentary rocks, simi T P q; rocks consist of quartz, plagioclase, brown-green t hornblende, biotite, chlorite, sphene and opaque minerals; volcanic structures and textures rarely observed

TrPz u ULTRAMAFIC ROCKS--Serpentinized and partially serpen peridotite and dunite occurring in fault zones

MELANGE OF DUTCHMANS PEAK

TrPz a AMPHIBOLITE--Consists of interlayered metasedimentary metavolcanic rocks metamorphosed to upper greenschist al amphibolite facies; includes foliated and nonf amphibolite, siliceous schists, phyllite, and a discontinuous lenses of marble; locally lineated, f amphibolite is composed of plagioclase, blue-green to oliv hornblende, and minor amounts of epidote-group m clinopyroxene, biotite, quartz, calcite, sphene, and minerals; nonfoliated amphibolite has a similar mineral has relict features characteristic of volcanic rocks i amygdules and phenocrysts; schist and phyllite are comp quartz, plagioclase, potassium feldspar, biotite, mu almandine garnet, tourmaline, apatite, opaque mineral chlorite; isotopic analyses of hornblende from the ad Condrey Mountain quadrangle, Ca. yield ages of 148 and 1 (Lanphere and others, 1968) suggesting a Jurassic metamorphism

TrPz gb GABBRO AND METAGABBRO--Predominantly fine to medium grained bearing hornblende gabbro with relict pyroxene; cons plagioclase (labradorite), locally zoned to oligocl usually saussuritized or replaced by clinozoisite, he enclosing relicts of clinopyroxene and orthopyroxene, biotite, chlorite, sericite, and opaque minerals; the ass with serpentinite (TrPz sp) and the irregular and podlik of the metagabbro masses suggest they are part of a dis ophiolite

TrPz sp SERPENTINITE--Serpentinized peridotite and dunite, local ch pods, lenses and disseminations; develops brownish- or b soils, locally, pyroxenite dikes and bands; miner orthopyroxene, clinopyroxenes, olivine, chromite, ma serpentine minerals, locally anthophyllite, talc, c minerals, and chlorite; serpentine mineral assemblages v chrysotile-lizardite and brucite to more common assem antigorite, magnetite, locally with talc and tremoli higher grade assemblages with antigorite imply that som all serpentinites underwent the upper greenschist metamorphism of the enclosing metasedimentary and meta rocks (TrPz a); pod to tabular shapes suggest t serpentinite is part of a dismembered ophilite; schisto actinolite rocks occur locally in thin tabular bodies

CONDREY MOUNTAIN SCHIST

Predominantly chlorite and muscovite schists and minor blue described in detail by Hotz (1979) and Donato and Colem 1980); K-Ar ages of muscovite as 141 m.y. (Lanphere and 1968) and whole-rock ages are 155±3 m.y. (Suppe and A 1972) which represents the metamorphic age; tw deformational events recognized: (1) isoclinal folding, (2) north-south folding which produce crenula steeply dipping cleavage

TrPz cm MUSCOVITE-QUARTZ SCHIST--Muscovite-quartz schist with pseudomorphs after pyrite, consists of thin (milli centimeter-size) lenticular laminae of elongate interlocking quartz grains, laminae or thin folia of accompanied by rare flakes of chlorite, local porphyoblasts, accessory tourmaline sphene, clinozoisite, actinolite; bluish-gray to black quartz muscovite schists are included in the unit; rare thin layers containing quartz, riebeckite, garnet, stilphomel albite; probably greenschist facies metamorphosed equiv fine-grained sandstone

TrPz cc CHLORITE SCHIST--Highly foliated medium- to dark-green actinolite-epidote-chlorite schist consists of thin lenticular laminae of ferromagnesian minerals and q albite; ferromagnesian minerals are actinolite, chlorite; accessory minerals are apatite, flakes of m sphene and local garnet, stilpnomelane, and calcite; probably basaltic to andesitic tuffs and flows

TrPz csp METASERPENTINITE--Predominantly antigorite-magnetite-brucit with minor talc-magnesite schist and clinozoisite-ac albite garnet metagabbro

ATTITUDE OF BEDDING

62 INCLINED, ball showing direction of top of bedding

VERTICAL

ATTITUDE OF FOLIATION

42 INCLINED

VERTICAL

81 CONTACT--Approximately located, dashed where inferred, b

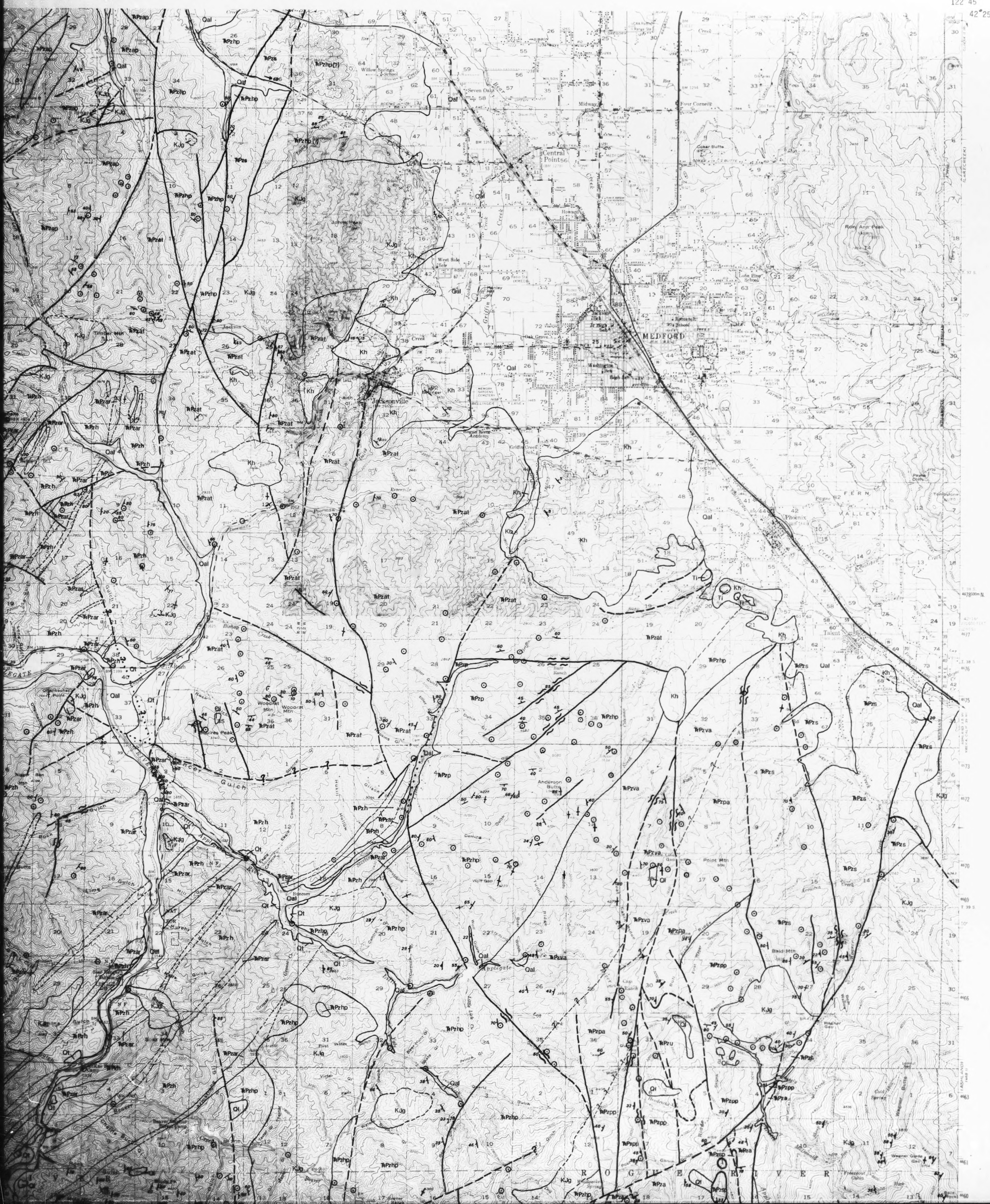
71 FAULT--Approximately located, dashed where inferred, concealed; bar, dip

THRUST FAULT--Approximately located, dashed where infe where concealed; bar, dip; teeth on upper plate

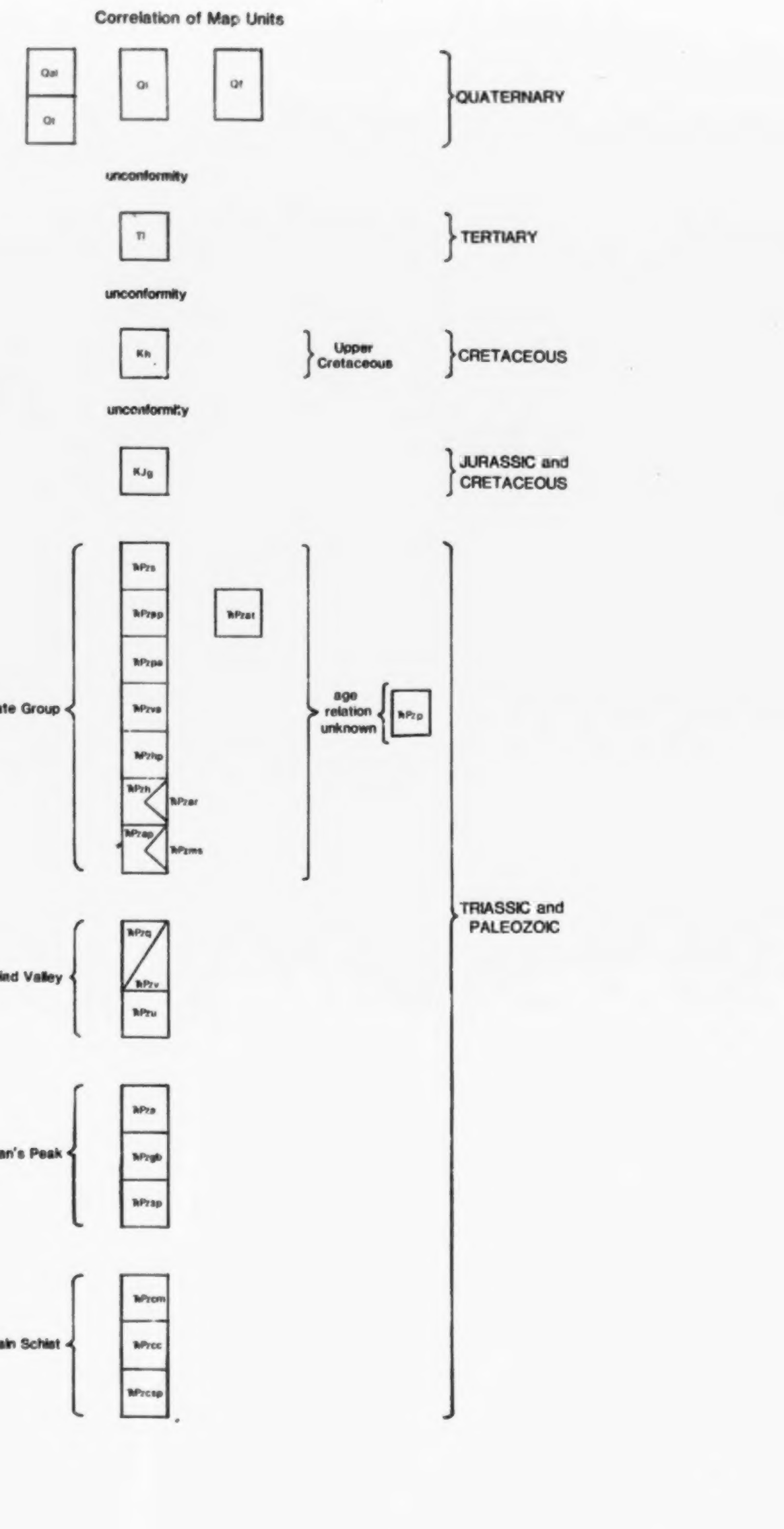
MAXIMUM LIMITS OF GLACIAL ICE

23 ATTITUDE OF LINEATION, MAY BE COMBINED WITH FOLIATION

◎ SAMPLE COLLECTED OR DETAILED OBSERVATIONS MADE



Correlation of Map Units



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APPLEGATE GROUP

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TRPzpp PORPHYRITIC PYROXENE-PLAGIOCLASE ANDESITE--Characterized by augite and plagioclase phenocrysts in a relict pilotaxitic groundmass, locally vesicular; contains agglomerate with aphanitic black clasts in highly sheared matrix; metamorphosed to assemblages of actinolite, epidote, chlorite, albite, and quartz; base not exposed

TRPzpa PORPHYRITIC PLAGIOCLASE ANDESITE--Characterized by plagioclase phenocryst-rich andesitic flows with relict pillotaxitic groundmass textures; upper part contains 100 to 300 m thick agglomerate showing clasts of augite-plagioclase porphyritic andesite with relict pillotaxitic groundmass textures; locally contains interbedded plagioclase crystal-rich tuffs; metamorphosed to assemblages of olive-green hornblende, actinolite, epidote, and chlorite; near granitic plutons developes hornfelsic and granofelsic textures with albite, quartz, biotite, and locally garnet, or into layered and locally lineated amphibolite; underlies pyroxene-plagioclase porphyritic andesite (TRPzpp).

TRPzva VESICULAR ANDESITIC TO BASALTIC FLOWS--Characterized by calcite filled amygdules in augite-plagioclase porphyritic andesitic to basaltic flows with relict pillotaxitic to hyalopilitic groundmasses interbedded with rare marble lenses and intermediate to mafic tuffs; locally, relict ophitic and intersertal groundmass textures occur; pillow breccias and pillow basalts occur locally near the top of the unit; marbles, generally impure, containing waterworked volcaniclastic debris; volcanic rocks metamorphosed to assemblages of green hornblende, actinolite, epidote, quartz, and chlorite although original mineralogy locally preserved; conformably overlies hornblende-plagioclase porphyritic andesite (TRPzhp)

TRPzhp PORPHYRITIC HORNBLENDE-PLAGIOCLASE ANDESITE--Characterized by near equal amounts of hornblende and plagioclase phenocrysts in relict hyalopilitic to intersertal, locally pilotaxitic groundmass textures in flows of andesitic composition; unit includes minor amounts of pyroclastic rocks, local amygdaloidal flows, and quartz-plagioclase porphyritic dacites; metamorphosed to assemblages of olive-green hornblende, blue-green hornblende, actinolite, epidote, quartz, chlorite, and carbonate minerals; conformably underlies vesicular andesite (TRPzva)

TRPzh PORPHYRITIC HORNBLENDE ANDESITE--Characterized by brown or olive-brown hornblende phenocrysts up to 1 cm in diameter in porphyritic hornblende and plagioclase andesitic flow rocks; interbedded with fine-grained to aphanitic argillites (TRPzar); lower contact chosen to coincide with lowermost argillite; includes in upper part an apparent thickness of 3,000 to 5,000 m of andesitic pyroclastic volcanic rocks interbedded with minor amounts of porphyritic hornblende-plagioclase andesite and dacite to rhyodacite flows (best exposed near Tallowbox Mountain, Ruch quadrangle); in middle part contains minor amounts of porphyritic quartz-plagioclase dacite flows, dacitic to rhyodacitic agglomerates, and porphyritic augite andesite flows; lower part contains interbedded amygdaloidal porphyritic plagioclase andesite (apparent thickness 300-500 m) and minor porphyritic quartz-plagioclase dacite flows; relict groundmass textures predominantly hyalopilitic to pilotaxitic in flow rocks; andesitic pyroclastic rocks consist of breccias, thinly to moderately bedded waterworked tuffs, hornblende-plagioclase crystal-rich pyroclastic rocks, black aphanitic argillites, and minor agglomerate; whole unit contains interbedded argillites, which were mapped where scale permitted; rocks metamorphosed to assemblages of blue-green hornblende, actinolite-tremolite, epidote, albite, biotite, chlorite, quartz, and carbonate minerals; locally, original phenocrysts and groundmass textures were preserved; where sheared, rocks best classified as greenstone; conformably underlies porphyritic hornblende-plagioclase andesite unit (TRPzhp)

TRPzar ARGILLITE--Black, gray, or red fine- and medium-grained locally aphanitic bedded tuff, volcaniclastic mudstones, and sandstones; slump structures and contorted bedding common, locally graded beds and crossbedding; consists of quartz, hornblende, plagioclase, actinolite, chlorite, epidote-group minerals, sulfide and oxide minerals; pyrite common; locally textures suggest layers of glass shards, now chlorite; quartz veining

ROCKS OF SEIAD VALLEY

TRPzq QUARTZITE, METASEDIMENTARY ROCKS, MARBLES, AND INTERMEDIATE TO SILICEOUS METAVOLCANIC ROCKS--Rocks regionally metamorphosed to greenschist facies and locally up to pyroxene-hornfels facies by contact metamorphism forming impure quartzites, marbles, calc-silicate rocks, hornfels, granofels, schists, gneisses, and amphibolites. Protoliths include impure quartz sandstones, quartz-rich arkoses, limestones, graphitic shales, mudstones, graywackes, volcaniclastic sandstones, thinly interbedded graphitic shales and quartz sandstones, thinly interbedded orthoquartzite and limestone; andesitic, dacitic, and siliceous porphyritic and nonporphyritic flows, dikes, and sills, and pyroclastic rocks and tuffs; unit characterized by impure quartzites, quartz-biotite, and quartz-amphibole schists; metamorphic mineralogy described by Godchaux (1969) includes quartz, plagioclase (albite-oligoclase), orthoclase, chlorite, biotite, muscovite, amphiboles, ortho- and clinopyroxene, clinozoisite, epidote, calcite, dolomite, cordierite, idocrase, diopside, tourmaline, andalusite, garnet, graphite, sphene, zircon, apatite, and oxide and sulfide minerals. Some lithologies suggestive of shallow marine fluctuating beach-estuarine environment

TRPzv DACITIC TO ANDESITIC METAVOLCANIC ROCKS--Fine-grained, green, gray, and black, massive to foliated regionally metamorphosed dacitic to andesitic flows, flow breccias, agglomerate, tuff and tuff breccia interlayered with metasedimentary rocks, similar to T P q; rocks consist of quartz, plagioclase, brown-green to green hornblende, biotite, chlorite, sphene and opaque minerals; relict volcanic structures and textures rarely observed

TRPzu ULTRAMAFIC ROCKS--Serpentinized and partially serpentinized peridotite and dunite occurring in fault zones

MELANGE OF DUTCHMANS PEAK

TRPza AMPHIBOLITE--Consists of interlayered metasedimentary and metavolcanic rocks metamorphosed to upper greenschist almandine-amphibolite facies; includes foliated and nonfoliated amphibolite, siliceous schists, phyllite, and a minor discontinuous lenses of marble; locally lineated, foliated amphibolite is composed of plagioclase, blue-green to olive-grown hornblende, and minor amounts of epidote-group minerals, clinopyroxene, biotite, quartz, calcite, sphene, and opaque minerals; nonfoliated amphibolite has a similar mineralogy but has relict features characteristic of volcanic rocks including amygdules and phenocrysts; schist and phyllite are composed of quartz, plagioclase, potassium feldspar, biotite, muscovite, almandine garnet, tourmaline, apatite, opaque minerals, and chlorite; isotopic analyses of hornblende from the adjoining Condrey Mountain quadrangle, Ca. yield ages of 148 and 146 m.y. (Lanphere and others, 1968) suggesting a Jurassic age of metamorphism

TRPzgb GABBRO AND METAGABBRO--Predominantly fine to medium grained quartz-bearing hornblende gabbro with relict pyroxene; consists of plagioclase (labradorite), locally zoned to oligoclase and usually saussuritized or replaced by clinozoisite, hornblende enclosing relicts of clinopyroxene and orthopyroxene, quartz, biotite, chlorite, sericite, and opaque minerals; the association with serpentinite (TRPzsp) and the irregular and podlike shapes of the metagabbro masses suggest they are part of a dismembered ophiolite

TRPzsp SERPENTINITE--Serpentinized peridotite and dunite, local chromitite pods, lenses and disseminations; develops brownish- or brick-red soils, locally, pyroxenite dikes and bands; minerals are orthopyroxene, clinopyroxenes, olivine, chromite, magnetite, serpentine minerals, locally anthophyllite, talc, carbonate minerals, and chlorite; serpentine mineral assemblages vary from chrysotile-lizardite and brucite to more common assemblage of antigorite, magnetite, locally with talc and tremolite; the higher grade assemblages with antigorite imply that some if not all serpentinites underwent the upper greenschist facies metamorphism of the enclosing metasedimentary and metavolcanic rocks (TRPza); pod to tabular shapes suggest that the serpentinite is part of a dismembered ophilite; schistose talc-actinolite rocks occur locally in thin tabular bodies

CONDREY MOUNTAIN SCHIST

Predominantly chlorite and muscovite schists and minor blue schists described in detail by Hotz (1979) and Donato and Coleman (1979, 1980); K-Ar ages of muscovite as 141 m.y. (Lanphere and others, 1968) and whole-rock ages are 155±3 m.y. (Suppe and Armstrong, 1972) which represents the metamorphic age; two major deformational events recognized: (1) isoclinal recumbent folding, (2) north-south folding which produce crenulation and steeply dipping cleavage

TRPzcm MUSCOVITE-QUARTZ SCHIST--Muscovite-quartz schist with limonite pseudomorphs after pyrite, consists of thin (millimeter- to centimeter-size) lenticular laminae of elongate anhedral interlocking quartz grains, laminae or thin folia of muscovite accompanied by rare flakes of chlorite, local albite porphyoblasts, accessory tourmaline sphene, apatite, clinozoisite, actinolite; bluish-gray to black quartz-graphite muscovite schists are included in the unit; rare thin metachert layers containing quartz, riebeckite, garnet, stilphomelane, and albite; probably greenschist facies metamorphosed equivalent of fine-grained sandstone

TRPzcc CHLORITE SCHIST--Highly foliated medium- to dark-green quartz-actinolite-epidote-chlorite schist consists of thin flattened lenticular laminae of ferromagnesian minerals and quartz and albite; ferromagnesian minerals are actinolite, epidote, chlorite; accessory minerals are apatite, flakes of muscovite, sphene and local garnet, stilpnomelane, and calcite; protolith probably basaltic to andesitic tuffs and flows

TRPzcsp METASERPENTINITE--Predominantly antigorite-magnetite-brucite rocks with minor talc-magnesite schist and clinozoisite-actinolite-albite garnet metagabbro

ATTITUDE OF BEDDING

62 INCLINED, ball showing direction of top of bedding

VERTICAL

ATTITUDE OF FOLIATION

42 INCLINED

VERTICAL

81 CONTACT--Approximately located, dashed where inferred, bar shows dip

71 FAULT--Approximately located, dashed where inferred, dotted where concealed; bar, dip

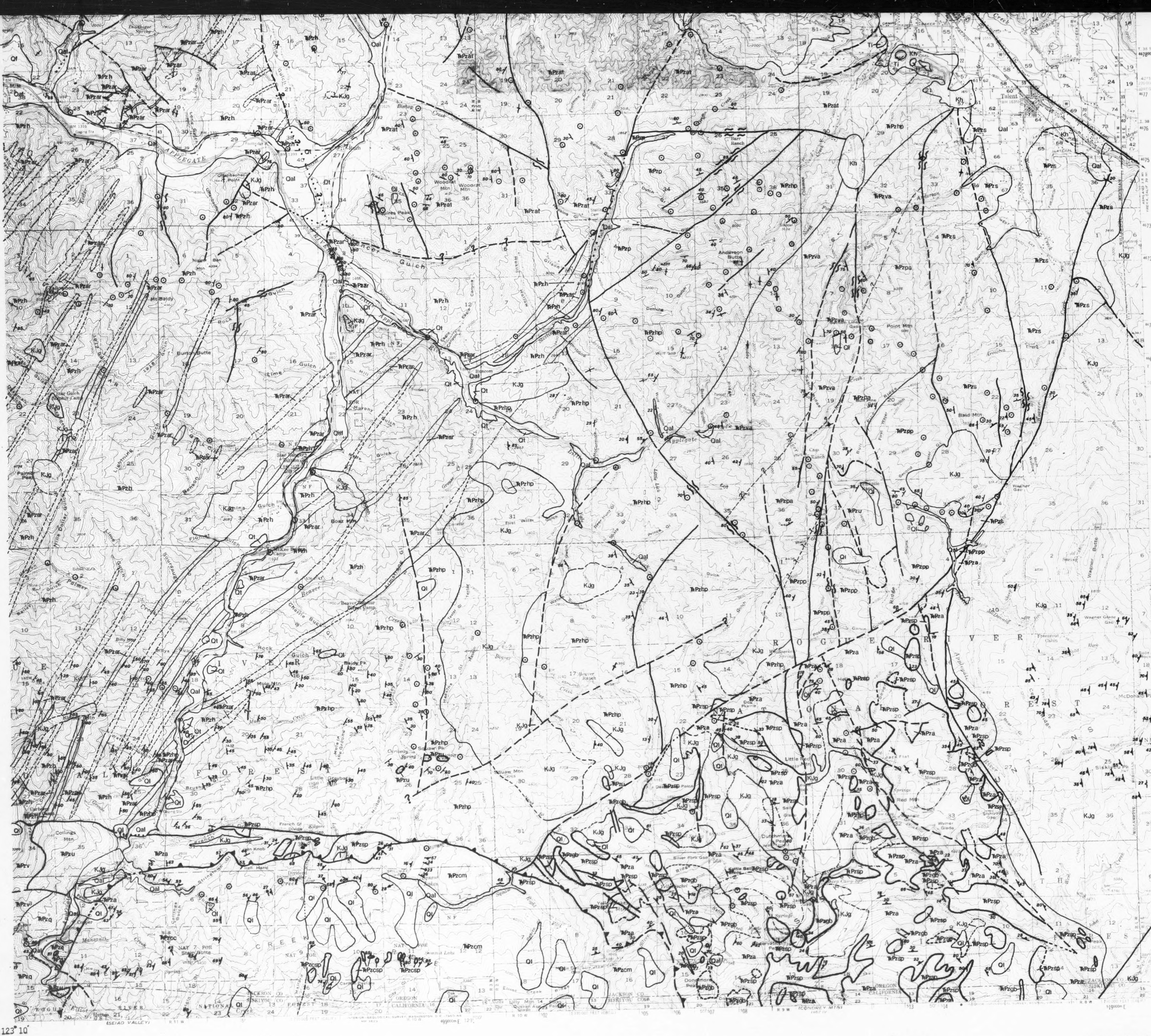
THRUST FAULT--Approximately located, dashed where inferred, dotted where concealed; bar, dip; teeth on upper plate

MAXIMUM LIMITS OF GLACIAL ICE

23 ATTITUDE OF LINEATION, MAY BE COMBINED WITH FOLIATION

◎ SAMPLE COLLECTED OR DETAILED OBSERVATIONS MADE

SOURCES OF DATA AND ACKNOWLEDGMENTS



Qt	TERRACE DEPOSITS--Alluvial deposits of unconsolidated silt, sand, and gravel; forms terraces 6 to 18 m above present stream grade and deposits are up to about 5 m thick; characterized by moderate to well-developed soils
Qf	ALLUVIAL FAN DEPOSITS--Consist of unconsolidated poorly sorted crudely bedded sand, gravel, and silt that range from late Pleistocene through Holocene age. They form fan or conic shaped surfaces at the mouths of creeks where deposition results from decreased stream capacity due to decreased stream gradients. Crude lensoidal bedding indicates rapidly changing sedimentary conditions
Ti	INTERMEDIATE COMPOSITION INTRUSIVE ROCKS--Small plugs and dikes in the Hornbrook Formation south of Phoenix
Kh	HORNBROOK FORMATION (LATE CRETACEOUS)--Thin to thick well-bedded fine-grained arkosic and lithic sandstones interbedded with pebbly sandstones and conglomerate in the lower part and faintly laminated, to thin-bedded siltstones and mudstones in the upper part. Conglomerate includes pebbles of quartz, diorite, gneiss, and metavolcanic rocks and sandstone locally cemented by calcite. The Hornbrook Formation is Late Cretaceous (Cenomanian to Turonian) age (Peck and others, 1956); some of the fossils present include the ammonites Mantelliceras, Collignoniceras hakeri (Anderson), Prionocyclus cvenulata (Anderson), and mollusks of the Glycymeris pacificus fauna
KJg	GRANITIC PLUTONIC ROCKS--Range widely in modal compositions from diorite to granite with tonalite the dominant rock type; generally gray to light-gray medium- to coarse-grained hypidiomorphic, inequigranular to equigranular, and locally porhyritic textures; consists of zoned, tabular to elongate plagioclase, potassium feldspar as phenocrysts but more commonly as groundmass and myrmekotic material, anhedral quartz, hornblende (commonly elongate), biotite, local muscovite, sphene, apatite, zircon, allanite, oxide and sulfide minerals, chlorite, and epidote-group minerals; Jacksonville pluton has a discordant K-Ar age of 134 m.y. on hornblende and 138 m.y. on biotite (Hotz, 1971); the Squaw Peaks pluton is characterized by numerous mafic xenoliths ranging in size from a few centimeters to thousands of millimeters in diameter composed of amphibolite, pyroxenite, peridotite, dunite, and gabbro; the Ashland pluton is composed of two intrusive phases (Donato, 1975 ; the initial phase being diked by the second phase; the initial phase consists of textural and compositional gradations of diorite, quartz diorite, tonalite, monzodiorite, quartz monzodiorite, granodiorite, quartz monzonite, and granite in which predominant mafic phase is hornblende; second phase is characterized by linear swarms of biotite-rich xenoliths and schlieren in quartz monzonite, granodiorite, and granite. Biotite is the dominant mafic mineral K-Ar ages on initial phase include a discordant 144-m.y. biotite and 160- and 166-m.y. hornblende; 146- to 147-m.y. hornblende-biotite age, and 133-m.y. biotite age (Hotz, 1971)

APPLEGATE GROUP

TRPzs	SHALE--Mainly shales; includes minor sandstone, layered tuffs, and finely laminated chert; shales consist of microcrystalline micaceous clay, minor quartz; shales may be gradational with more clastic rocks composed of clasts of clinopyroxene (most abundant), and plagioclase in a micaceous laminated matrix; sandstones are predominantly arkosic and composed of feldspar, quartz, hornblende, and biotite. The unit is best exposed along Wagner Creek south of Arrastra Creek in the eastern corner of the Talent quadrangle due south of the town of Talent. Locally, near the Ashland pluton, shales are intruded and contact metamorphosed by granitic rocks
TRPzpp	PORPHYRITIC PYROXENE-PLAGIOCLASE ANDESITE--Characterized by augite and plagioclase phenocrysts in a relict pilotaxitic groundmass, locally vesicular; contains agglomerate with aphanitic black clasts in highly sheared matrix; metamorphosed to assemblages of actinolite, epidote, chlorite, albite, and quartz; base not exposed
TRPzpa	PORPHYRITIC PLAGIOCLASE ANDESITE--Characterized by plagioclase phenocryst-rich andesitic flows with relict piliotaxitic groundmass textures; upper part contains 100 to 300 m thick agglomerate showing clasts of augite-plagioclase porphyritic andesite with relict piliotaxitic groundmass textures; locally contains interbedded plagioclase crystal-rich tuffs; metamorphosed to assemblages of olive-green hornblende, actinolite, epidote, and chlorite; near granitic plutons developes hornfelsic and granofelsic textures with albite, quartz, biotite, and locally garnet, or into layered and locally lineated amphibolite; underlies pyroxene-plagioclase porphyritic andesite (TRPzpp).
TRPzva	VESICULAR ANDESITIC TO BASALTIC FLOWS--Characterized by calcite filled amygdules in augite-plagioclase porphyritic andesitic to basaltic flows with relict piliotaxitic to hyalopilitic groundmasses interbedded with rare marble lenses and intermediate to mafic tuffs; locally, relict ophitic and intersertal groundmass textures occur; pillow breccias and pillow basalts occur locally near the top of the unit; marbles, generally impure, containing waterworked volcaniclastic debris; volcanic rocks metamorphosed to assemblages of green hornblende, actinolite, epidote, quartz, and chlorite although original mineralogy locally preserved; conformably overlies hornblende-plagioclase porphyritic andesite (TRPzhp)
TRPzhp	PORPHYRITIC HORNBLENDE-PLAGIOCLASE ANDESITE--Characterized by near equal amounts of hornblende and plagioclase phenocrysts in relict hyalopilitic to intersertal, locally pilotaxitic groundmass textures in flows of andesitic composition; unit includes minor amounts of pyroclastic rocks, local amygdaloidal flows, and quartz-plagioclase porphyritic dacites; metamorphosed to assemblages of olive-green hornblende, blue-green hornblende, actinolite, epidote, quartz, chlorite, and carbonate minerals; conformably underlies vesicular andesite (TRPzva)
TRPzh	PORPHYRITIC HORNBLENDE ANDESITE--Characterized by brown or olive-brown hornblende phenocrysts up to 1 cm in diameter in porphyritic hornblende and plagioclase andesitic flow rocks; interbedded with fine-grained to aphanitic argillites (TRPzar); lower contact chosen to coincide with lowermost argillite; includes in upper part an apparent thickness of 3,000 to 5,000 m of andesitic pyroclastic volcanic rocks interbedded with minor amounts of porphyritic hornblende-plagioclase andesite and dacite to rhyodacite flows (best exposed near Tallowbox Mountain, Ruch quadrangle); in middle part contains minor amounts of porphyritic quartz-plagioclase dacite flows, dacitic to rhyodacitic agglomerates, and porphyritic augite andesite flows; lower part contains interbedded amygdaloidal porphyritic plagioclase andesite (apparent thickness 300-500 m) and minor porphyritic quartz-plagioclase dacite flows; relict groundmass textures predominantly hyalopilitic to piliotaxitic in flow rocks; andesitic pyroclastic rocks consist of breccias, thinly to moderately bedded waterworked tuffs, hornblende-plagioclase crystal-rich pyroclastic rocks, black aphanitic argillites, and minor agglomerate; whole unit contains interbedded argillites, which were mapped where scale permitted; rocks metamorphosed to assemblages of blue-green hornblende, actinolite-tremolite, epidote, albite, biotite, chlorite, quartz, and carbonate minerals; locally, original phenocrysts and groundmass textures were preserved; where sheared, rocks best classified as greenstone; conformably underlies porphyritic hornblende-plagioclase andesite unit (TRPzhp)
TRPzar	ARGILLITE--Black, gray, or red fine- and medium-grained locally aphanitic bedded tuff, volcaniclastic mudstones, and sandstones; slump structures and contorted bedding common, locally graded beds and crossbedding; consists of quartz, hornblende, plagioclase, actinolite, chlorite, epidote-group minerals, sulfide and oxide minerals; pyrite common; locally textures suggest layers of glass shards, now chlorite; quartz veining common and unit locally silicified; parts of unit represent water-laid tuffs and volcanic debris, other parts may represent air-fall tuffs; interbedded with porphyritic hornblende andesite volcanics (TRPzh)
TRPzap	PORPHYRITIC AUGITE-PLAGIOCLASE ANDESITE AND ANDESITIC BASALT--Predominantly pale green to greenish gray, fine- to medium-grained porphyritic andesite and basalt flows; characterized by porphyritic augite and plagioclase andesite to basaltic flows with relict intersertal to ophitic groundmass textures; unit includes interbedded agglomerates and breccias of similar rocks, minor andesitic tuff breccias, dacitic to rhyodacitic breccias, tuffs, porphyritic quartz and plagioclase andesite flows and porphyritic plagioclase basalts, and ophitic textured hypabyssal basaltic intrusives; locally, groundmass textures are hyalopilitic in porphyritic flows; dacitic and rhyodacitic flows contain subhedral and resorbed quartz phenocrysts, locally with glomeroporphyritic textures; rocks metamorphosed to assemblages of plagioclase olive-green hornblende, blue-green hornblende, actinolite, chlorite, epidote-clinozoisite, and carbonate minerals, locally includes prehnite and biotite; groundmass textures are well preserved, although primary mineralogy generally recrystallized, phenocrysts are locally well preserved; near granitic plutons rocks develop granofelsic and hornfelsic textures; unit conformably underlies porphyritic hornblende andesite unit (TRPzh); volcanic rocks are interbedded with metasedimentary rocks (TRPzms) which were mapped separately where scale permitted
TRPzms	METASEDIMENTARY ROCKS--Includes shale, mudstone, volcanoclastic sandstones, graywacke, lithic wacke, conglomerate, waterworked cherty tuffs (argillites), minor radiolarian, and red and white recrystallized banded chert; conglomerates predominantly consist of sandstone, shale, chert, cherty tuffs, and limestone pebbles and cobbles floating in black aphanitic mudstone matrix; chert and cherty tuffs locally contain poorly preserved unidentifiable radiolarian cones; argillite beds generally 1 to 5 cm thick; metasedimentary rocks locally intruded by andesitic and basaltic dikes similar in composition and texture to flows in unit TRPzap.
TRPzp	PORPHYRITIC PLAGIOCLASE ANDESITIC FLOWS, TUFFS, AND AGGLOMERATES--Characterized by plagioclase phenocrysts in a relict pilotaxitic groundmass in flows and agglomerate clasts; includes a minor amount of porphyritic quartz-plagioclase dacite flows, a few local porphyritic hornblende-augite flows and amygdaloidal nonporphyritic andesite; metamorphosed to assemblages of olive-green hornblende, actinolite, epidote, quartz, and chlorite; stratigraphic position in Triassic and Paleozoic volcanic rocks unknown because unit is fault bounded
TRPzat	ANDESITIC AND DACITIC TUFFS, TUFF BRECCIAS, AND MINOR FLOWS AND VOLCANICLASTIC SEDIMENTS--Fine- to medium-grained greenish-gray andesitic to dacitic pyroclastic rocks; tuffs predominantly consist of crystals of broken feldspar with lesser amounts of pyroxene and (or) amphibole in an altered glassy matrix; feldspar is unzoned oligoclase-andesine; pyroxenes are pleochroic pale green to clear augites; amphiboles are green hornblende, rare rock fragments; minor flows are interlayered with tuffs as are thin volcaniclastic sandstone; sandstone consist of subrounded to subangular clasts of feldspar, hornblende, and volcanic rock fragments in a silty matrix; rocks are metamorphosed to lower greenschist facies; plagioclase show argillic alteration, mafic minerals display minor clinozoisite-epidote alteration, however, chlorite predominates. Unit outcrops mainly in the area of Bishop Creek, Squires and Woodrat Mountain. Hornbrook Formation unconformably overlies unit at contact on road between Ruch and Jacksonville and along south fork of Jackson Creek

pyroclastic rocks and tuffs; unit characteri
quartzites, quartz-biotite, and quartz-amphibo
metamorphic mineralogy described by Godchaux (19
quartz, plagioclase (albite-oligoclase), orthocla
biotite, muscovite, amphiboles, ortho- and c
clinozoisite, epidote, calcite, dolomite, cordierit
diopside, tourmaline, andalusite, garnet, graph
zircon, apatite, and oxide and sulfide miner
lithologies suggestive of shallow marine fluct
estuarine environment

TRPzv DACITIC TO ANDESITIC METAVOLCANIC ROCKS--Fine-grained,
and black, massive to foliated regionally metamorp
to andesitic flows, flow breccias, agglomerate,
breccia interlayered with metasedimentary rocks
T P q; rocks consist of quartz, plagioclase, brown
hornblende, biotite, chlorite, sphene and opaque mi
volcanic structures and textures rarely observed

TRPzu ULTRAMAFIC ROCKS--Serpentinized and partially
peridotite and dunite occurring in fault zones

MELANGE OF DUTCHMANS PEAK

TRPza AMPHIBOLITE--Consists of interlayered metasedi
metavolcanic rocks metamorphosed to upper greensch
amphibolite facies; includes foliated and
amphibolite, siliceous schists, phyllite,
discontinuous lenses of marble; locally line
amphibolite is composed of plagioclase, blue-green
hornblende, and minor amounts of epidote-g
clinopyroxene, biotite, quartz, calcite, sphen
minerals; nonfoliated amphibolite has a similar
has relict features characteristic of volcanic
amygdules and phenocrysts; schist and phyllite
quartz, plagioclase, potassium feldspar, biot
almandine garnet, tourmaline, apatite, opaque
chlorite; isotopic analyses of hornblende from
Condrey Mountain quadrangle, Ca. yield ages of 1
(Lanphere and others, 1968) suggesting a Ju
metamorphism

TRPzgb GABBRO AND METAGABBRO--Predominantly fine to medium
bearing hornblende gabbro with relict pyroxe
plagioclase (labradorite), locally zoned to
usually saussuritized or replaced by clinozoi
enclosing relicts of clinopyroxene and orthopy
biotite, chlorite, sericite, and opaque minerals;
with serpentinite (TRPzsp) and the irregular an
of the metagabbro masses suggest they are part o
ophiolite

TRPzsp SERPENTINITE--Serpentinized peridotite and dunite,
pods, lenses and disseminations; develops browni
soils, locally, pyroxenite dikes and bands
orthopyroxene, clinopyroxenes, olivine, chro
serpentine minerals, locally anthophyllite,
minerals, and chlorite; serpentine mineral assem
chrysotile-lizardite and brucite to more comm
antigorite, magnetite, locally with talc and
higher grade assemblages with antigorite imply
all serpentinites underwent the upper gre
metamorphism of the enclosing metasedimentary
rocks (TRPza); pod to tabular shapes su
serpentinite is part of a dismembered ophilite;
actinolite rocks occur locally in this tabular b

CONDREY MOUNTAIN SCHIST

Predominantly chlorite and muscovite schists and m
described in detail by Hotz (1979) and Donato a
1980); K-Ar ages of muscovite as 141 m.y. (Lan
1968) and whole-rock ages are 155±3 m.y. (Sup
1972) which represents the metamorphic
deformational events recognized: (1) iso
folding, (2) north-south folding which produc
steeply dipping cleavage

TRPzcm MUSCOVITE-QUARTZ SCHIST--Muscovite-quartz schist
pseudomorphs after pyrite, consists of thin
centimeter-size) lenticular laminae of
interlocking quartz grains, laminae or thin
accompanied by rare flakes of chlorite
porphyroblasts, accessory tourmaline
clinozoisite, actinolite; bluish-gray to bla
muscovite schists are included in the unit;
layers containing quartz, riebeckite, garnet,
albite; probably greenschist facies metamorph
fine-grained sandstone

TRPzcc CHLORITE SCHIST--Highly foliated medium- to
actinolite-epidote-chlorite schist consists
lenticular laminae of ferromagnesian minera
albite; ferromagnesian minerals are act
chlorite; accessory minerals are apatite, fl
sphene and local garnet, stilpnomelane, and
probably basaltic to andesitic tuffs and flow

TRPzcsp METASERPENTINITE--Predominantly antigorite-magne
with minor talc-magnesite schist and clino
albite garnet metagabbro

ATTITUDE OF BEDDING

62 INCLINED, ball showing direction of top of
VERTICAL

ATTITUDE OF FOLIATION

42 INCLINED
VERTICAL
81 CONTACT--Approximately located, dashed where
71 FAULT--Approximately located, dashed where
concealed; bar, dip
THRUST FAULT--Approximately located, dashe
where concealed; bar, dip; teeth on uppe
MAXIMUM LIMITS OF GLACIAL ICE
23 ATTITUDE OF LINEATION, MAY BE COMBINED WITH
◎ SAMPLE COLLECTED OR DETAILED OBSERVATIONS M

SOURCES OF DATA AND ACKNOWLEDGMEN

Extensive use was made of geologic mapping by We
Wells (1956), Engelhardt (1966), Medaris (1966), Dona
and Beskow (1977), and Donato and Coleman (1980) as
during mapping. Appropriate parts of these studies
this present reconnaissance map. About three man-mo
area between 1974 and 1979.
Len Ramp (Oregon Dept. Geology and Mineral Ind
advice based on his knowledge of the area
acknowledgment. Dan Laird (1974) and Lincoln A. Pa
able field assistants.

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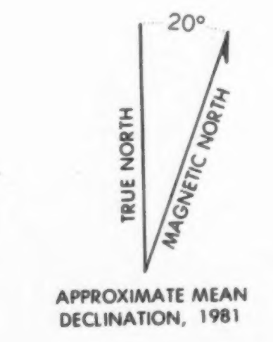
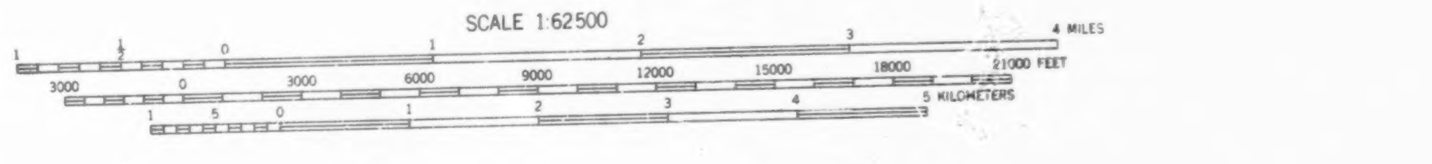




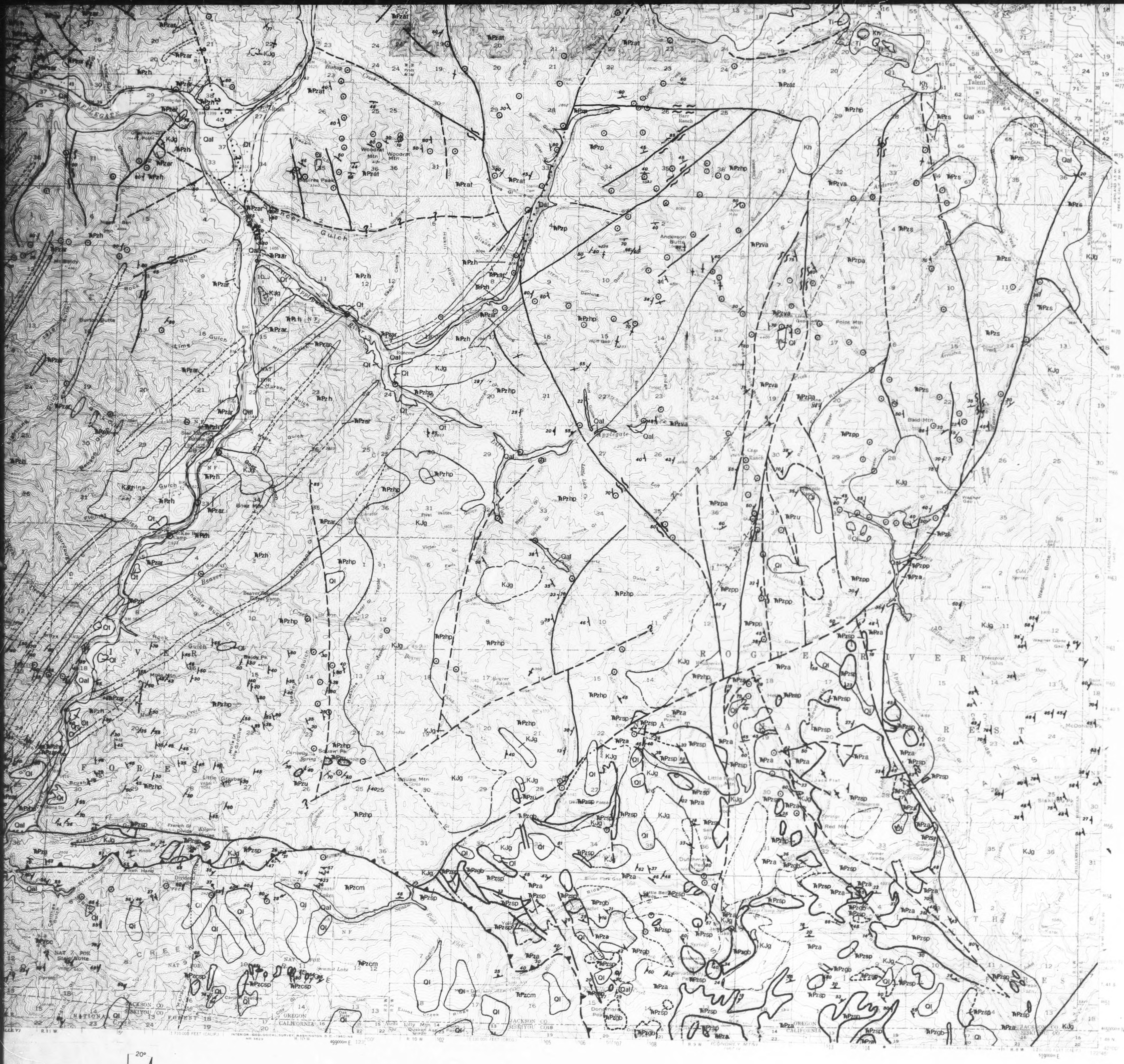
This report is preliminary and has not been reviewed for conformity with U.S. Geological Survey editorial standards and stratigraphic nomenclature.

RECONNAISSANCE GEOLOGIC MAP OF PARTS OF THE GOLD HILL, RUCH, MEDFORD, AND TALENT 15′ QUADRANGLES, SOUTHWESTERN OREGON

by

Will N. Blair, Albert Wong, Barry C. Moring, James B. Barnard, Norman J Page, and Floyd Gray

1981



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TRPzpp PORPHYRITIC PYROXENE-PLAGIOCLASE ANDESITE--Characterized by augite and plagioclase phenocrysts in a relict pilotaxitic groundmass, locally vesicular; contains agglomerate with aphanitic black clasts in highly sheared matrix; metamorphosed to assemblages of actinolite, epidote, chlorite, albite, and quartz; base not exposed

TRPzpa PORPHYRITIC PLAGIOCLASE ANDESITE--Characterized by plagioclase phenocryst-rich andesitic flows with relict piliotaxitic groundmass textures; upper part contains 100 to 300 m thick agglomerate showing clasts of augite-plagioclase porphyritic andesite with relict piliotaxitic groundmass textures; locally contains interbedded plagioclase crystal-rich tuffs; metamorphosed to assemblages of olive-green hornblende, actinolite, epidote, and chlorite; near granitic plutons developes hornfelsic and granofelsic textures with albite, quartz, biotite, and locally garnet, or into layered and locally lineated amphibolite; underlies pyroxene-plagioclase porphyritic andesite (TRPzpp).

TRPzva VESICULAR ANDESITIC TO BASALTIC FLOWS--Characterized by calcite filled amygdules in augite-plagioclase porphyritic andesitic to basaltic flows with relict piliotaxitic to hyalopilitic groundmasses interbedded with rare marble lenses and intermediate to mafic tuffs; locally, relict ophitic and intersertal groundmass textures occur; pillow breccias and pillow basalts occur locally near the top of the unit; marbles, generally impure, containing waterworked volcaniclastic debris; volcanic rocks metamorphosed to assemblages of green hornblende, actinolite, epidote, quartz, and chlorite although original mineralogy locally preserved; conformably overlies hornblende-plagioclase porphyritic andesite (TRPzhp)

TRPzhp PORPHYRITIC HORNBLENDE-PLAGIOCLASE ANDESITE--Characterized by near equal amounts of hornblende and plagioclase phenocrysts in relict hyalopilitic to intersertal, locally pilotaxitic groundmass textures in flows of andesitic composition; unit includes minor amounts of pyroclastic rocks, local amygdaloidal flows, and quartz-plagioclase porphyritic dacites; metamorphosed to assemblages of olive-green hornblende, blue-green hornblende, actinolite, epidote, quartz, chlorite, and carbonate minerals; conformably underlies vesicular andesite (TRPzva)

TRPzh PORPHYRITIC HORNBLENDE ANDESITE--Characterized by brown or olive-brown hornblende phenocrysts up to 1 cm in diameter in porphyritic hornblende and plagioclase andesitic flow rocks; interbedded with fine-grained to aphanitic argillites (TRPzar); lower contact chosen to coincide with lowermost argillite; includes in upper part an apparent thickness of 3,000 to 5,000 m of andesitic pyroclastic volcanic rocks interbedded with minor amounts of porphyritic hornblende-plagioclase andesite and dacite to rhyodacite flows (best exposed near Tallowbox Mountain, Ruch quadrangle); in middle part contains minor amounts of porphyritic quartz-plagioclase dacite flows, dacitic to rhyodacitic agglomerates, and porphyritic augite andesite flows; lower part contains interbedded amygdaloidal porphyritic plagioclase andesite (apparent thickness 300-500 m) and minor porphyritic quartz-plagioclase dacite flows; relict groundmass textures predominantly hyalopilitic to piliotaxitic in flow rocks; andesitic pyroclastic rocks consist of breccias, thinly to moderately bedded waterworked tuffs, hornblende-plagioclase crystal-rich pyroclastic rocks, black aphanitic argillites, and minor agglomerate; whole unit contains interbedded argillites, which were mapped where scale permitted; rocks metamorphosed to assemblages of blue-green hornblende, actinolite-tremolite, epidote, albite, biotite, chlorite, quartz, and carbonate minerals; locally, original phenocrysts and groundmass textures were preserved; where sheared, rocks best classified as greenstone; conformably underlies porphyritic hornblende-plagioclase andesite unit (TRPzhp)

TRPzar ARGILLITE--Black, gray, or red fine- and medium-grained locally aphanitic bedded tuff, volcaniclastic mudstones, and sandstones; slump structures and contorted bedding common, locally graded beds and crossbedding; consists of quartz, hornblende, plagioclase, actinolite, chlorite, epidote-group minerals, sulfide and oxide minerals; pyrite common; locally textures suggest layers of glass shards, now chlorite; quartz veining common and unit locally silicified; parts of unit represent water-laid tuffs and volcanic debris, other parts may represent air-fall tuffs; interbedded with porphyritic hornblende andesite volcanics (TRPzh)

TRPzap PORPHYRITIC AUGITE-PLAGIOCLASE ANDESITE AND ANDESITIC BASALT--Predominantly pale green to greenish gray, fine- to medium-grained porphyritic andesite and basalt flows; characterized by porphyritic augite and plagioclase andesite to basaltic flows with relict intersertal to ophitic groundmass textures; unit includes interbedded agglomerates and breccias of similar rocks, minor andesitic tuff breccias, dacitic to rhyodacitic breccias, tuffs, porphyritic quartz and plagioclase andesite flows and porphyritic plagioclase basalts, and ophitic textured hypabyssal basaltic intrusives; locally, groundmass textures are hyalopilitic in porphyritic flows; dacitic and rhyodacitic flows contain subhedral and resorbed quartz phenocrysts, locally with glomeroporphyritic textures; rocks metamorphosed to assemblages of plagioclase olive-green hornblende, blue-green hornblende, actinolite, chlorite, epidote-clinozoisite, and carbonate minerals, locally includes prehnite and biotite; groundmass textures are well preserved, although primary mineralogy generally recrystallized, phenocrysts are locally well preserved; near granitic plutons rocks develop granofelsic and hornfelsic textures; unit conformably underlies porphyritic hornblende andesite unit (TRPzh); volcanic rocks are interbedded with metasedimentary rocks (TRPzms) which were mapped separately where scale permitted

TRPzms METASEDIMENTARY ROCKS--Includes shale, mudstone, volcanoclastic sandstones, graywacke, lithic wacke, conglomerate, waterworked cherty tuffs (argillites), minor radiolarian, and red and white recrystallized banded chert; conglomerates predominantly consist of sandstone, shale, chert, cherty tuffs, and limestone pebbles and cobbles floating in black aphanitic mudstone matrix; chert and cherty tuffs locally contain poorly preserved unidentifiable radiolarian cones; argillite beds generally 1 to 5 cm thick; metasedimentary rocks locally intruded by andesitic and basaltic dikes similar in composition and texture to flows in unit TRPzap.

TRPzp PORPHYRITIC PLAGIOCLASE ANDESITIC FLOWS, TUFFS, AND AGGLOMERATES--Characterized by plagioclase phenocrysts in a relict pilotaxitic groundmass in flows and agglomerate clasts; includes a minor amount of porphyritic quartz-plagioclase dacite flows, a few local porphyritic hornblende-augite flows and amygdaloidal nonporphyritic andesite; metamorphosed to assemblages of olive-green hornblende, actinolite, epidote, quartz, and chlorite; stratigraphic position in Triassic and Paleozoic volcanic rocks unknown because unit is fault bounded

TRPzat ANDESITIC AND DACITIC TUFFS, TUFF BRECCIAS, AND MINOR FLOWS AND VOLCANICLASTIC SEDIMENTS--Fine- to medium-grained greenish-gray andesitic to dacitic pyroclastic rocks; tuffs predominantly consist of crystals of broken feldspar with lesser amounts of pyroxene and (or) amphibole in an altered glassy matrix; feldspar is unzoned oligoclase-andesine; pyroxenes are pleochroic pale green to clear augites; amphiboles are green hornblende, rare rock fragments; minor flows are interlayered with tuffs as are thin volcaniclastic sandstone; sandstone consist of subrounded to subangular clasts of feldspar, hornblende, and volcanic rock fragments in a silty matrix; rocks are metamorphosed to lower greenschist facies; plagioclase show argillic alteration, mafic minerals display minor clinozoisite-epidote alteration, however, chlorite predominates. Unit outcrops mainly in the area of Bishop Creek, Squires and Woodrat Mountain. Hornbrook Formation unconformably overlies unit at contact on road between Ruch and Jacksonville and along south fork of Jackson Creek

orthoquartzite and limestone; andesitic, dacitic, and siliceous porphyritic and nonporphyritic flows, dikes, and sills, and pyroclastic rocks and tuffs; unit characterized by impure quartzites, quartz-biotite, and quartz-amphibole schists; metamorphic mineralogy described by Godchaux (1969) includes quartz, plagioclase (albite-oligoclase), orthoclase, chlorite, biotite, muscovite, amphiboles, ortho- and clinopyroxene, clinozoisite, epidote, calcite, dolomite, cordierite, idocrase, diopside, tourmaline, andalusite, garnet, graphite, sphene, zircon, apatite, and oxide and sulfide minerals. Some lithologies suggestive of shallow marine fluctuating beach-estuarine environment

TRPzv DACITIC TO ANDESITIC METAVOLCANIC ROCKS--Fine-grained, green, gray, and black, massive to foliated regionally metamorphosed dacitic to andesitic flows, flow breccias, agglomerate, tuff and tuff breccia interlayered with metasedimentary rocks, similar to T P q; rocks consist of quartz, plagioclase, brown-green to green hornblende, biotite, chlorite, sphene and opaque minerals; relict volcanic structures and textures rarely observed

TRPzu ULTRAMAFIC ROCKS--Serpentinized and partially serpentinized peridotite and dunite occurring in fault zones

MELANGE OF DUTCHMANS PEAK

TRPza AMPHIBOLITE--Consists of interlayered metasedimentary and metavolcanic rocks metamorphosed to upper greenschist almandine-amphibolite facies; includes foliated and nonfoliated amphibolite, siliceous schists, phyllite, and a minor discontinuous lenses of marble; locally lineated, foliated amphibolite is composed of plagioclase, blue-green to olive-green hornblende, and minor amounts of epidote-group minerals, clinopyroxene, biotite, quartz, calcite, sphene, and opaque minerals; nonfoliated amphibolite has a similar mineralogy but has relict features characteristic of volcanic rocks including amygdules and phenocrysts; schist and phyllite are composed of quartz, plagioclase, potassium feldspar, biotite, muscovite, almandine garnet, tourmaline, apatite, opaque minerals, and chlorite; isotopic analyses of hornblende from the adjoining Condrey Mountain quadrangle, Ca. yield ages of 148 and 146 m.y. (Lanphere and others, 1968) suggesting a Jurassic age of metamorphism

TRPzgb GABBRO AND METAGABBRO--Predominantly fine to medium grained quartz-bearing hornblende gabbro with relict pyroxene; consists of plagioclase (labradorite), locally zoned to oligoclase and usually saussuritized or replaced by clinozoisite, hornblende enclosing relicts of clinopyroxene and orthopyroxene, quartz, biotite, chlorite, sericite, and opaque minerals; the association with serpentinite (TRPzsp) and the irregular and podlike shapes of the metagabbro masses suggest they are part of a dismembered ophiolite

TRPzsp SERPENTINITE--Serpentinized peridotite and dunite, local chromitite pods, lenses and disseminations; develops brownish- or brick-red soils, locally, pyroxenite dikes and bands; minerals are orthopyroxene, clinopyroxenes, olivine, chromite, magnetite, serpentine minerals, locally anthophyllite, talc, carbonate minerals, and chlorite; serpentine mineral assemblages vary from chrysotile-lizardite and brucite to more common assemblage of antigorite, magnetite, locally with talc and tremolite; the higher grade assemblages with antigorite imply that some if not all serpentinites underwent the upper greenschist facies metamorphism of the enclosing metasedimentary and metavolcanic rocks (TRPza); pod to tabular shapes suggest that the serpentinite is part of a dismembered ophilite; schistose talc-actinolite rocks occur locally in thin tabular bodies

CONDREY MOUNTAIN SCHIST

Predominantly chlorite and muscovite schists and minor blue schists described in detail by Hotz (1979) and Donato and Coleman (1979, 1980); K-Ar ages of muscovite as 141 m.y. (Lanphere and others, 1968) and whole-rock ages are 155±3 m.y. (Suppe and Armstrong, 1972) which represents the metamorphic age; two major deformational events recognized: (1) isoclinal recumbent folding, (2) north-south folding which produce crenulation and steeply dipping cleavage

TRPzcm MUSCOVITE-QUARTZ SCHIST--Muscovite-quartz schist with limonite pseudomorphs after pyrite, consists of thin (millimeter- to centimeter-size) lenticular laminae of elongate anhedral interlocking quartz grains, laminae or thin folia of muscovite accompanied by rare flakes of chlorite, local albite porphyoblasts, accessory tourmaline sphene, apatite, clinozoisite, actinolite; bluish-gray to black quartz-graphite muscovite schists are included in the unit; rare thin metachert layers containing quartz, riebeckite, garnet, stilphomelane, and albite; probably greenschist facies metamorphosed equivalent of fine-grained sandstone

TRPzcc CHLORITE SCHIST--Highly foliated medium- to dark-green quartz-actinolite-epidote-chlorite schist consists of thin flattened lenticular laminae of ferromagnesian minerals and quartz and albite; ferromagnesian minerals are actinolite, epidote, chlorite; accessory minerals are apatite, flakes of muscovite, sphene and local garnet, stilpnomelane, and calcite; protolith probably basaltic to andesitic tuffs and flows

TRPzcsp METASERPENTINITE--Predominantly antigorite-magnetite-brucite rocks with minor talc-magnesite schist and clinozoisite-actinolite-albite garnet metagabbro

ATTITUDE OF BEDDING

62 INCLINED, ball showing direction of top of bedding

VERTICAL

ATTITUDE OF FOLIATION

42 INCLINED

VERTICAL

81 CONTACT--Approximately located, dashed where inferred, bar shows dip

71 FAULT--Approximately located, dashed where inferred, dotted where concealed; bar, dip

THRUST FAULT--Approximately located, dashed where inferred, dotted where concealed; bar, dip; teeth on upper plate

MAXIMUM LIMITS OF GLACIAL ICE

23 ATTITUDE OF LINEATION, MAY BE COMBINED WITH FOLIATION

⊙ SAMPLE COLLECTED OR DETAILED OBSERVATIONS MADE

SOURCES OF DATA AND ACKNOWLEDGMENTS

Extensive use was made of geologic mapping by Wells and others (1940), Wells (1956), Engelhardt (1966), Medaris (1966), Donato (1975), Kays, Ferns, and Beskow (1977), and Donato and Coleman (1980) as background information during mapping. Appropriate parts of these studies were also compiled for this present reconnaissance map. About three man-months were spent in the area between 1974 and 1979.

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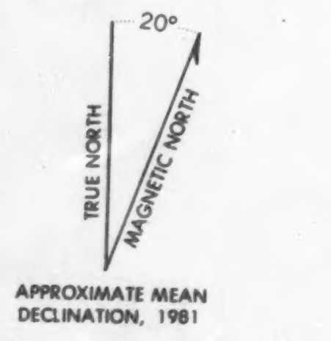

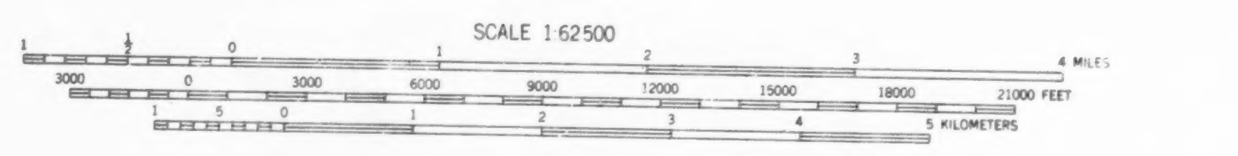
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This report is preliminary and has not been reviewed for conformity with U.S. Geological Survey editorial standards and stratigraphic nomenclature.

RECONNAISSANCE GEOLOGIC MAP OF PARTS OF THE GOLD HILL, RUCH, MEDFORD, AND TALENT 15' QUADRANGLES, SOUTHWESTERN OREGON

by

Will N. Blair, Albert Wong, Barry C. Moring, James B. Barnard, Norman J Page, and Floyd Gray

1981